Claims

1. A method for producing an active heterodimeric AMV-RT in prokaryotic host cells, wherein
   (i) one or several DNA sequence(s) which code for the α- and/or β-chain of the AMV-RT are cloned in expression plasmids,
   (ii) the expression plasmids are transformed in prokaryotic cells,
   (iii) the soluble expression of the heterodimeric AMV-RT is induced and
   (iv) the recombinant heterodimeric AMV-RT is isolated from the cells.

2. The method of claim 1, wherein the DNA sequences coding for the α- and β-chain are expressed on separate expression plasmids cloned into one cell.

3. The method of 1, wherein the DNA sequences coding for the α- and β-chain are expressed on one expression plasmid cloned into one cell.

4. The method of claim 1, wherein the α- and the β-chain are fused with a peptide sequence.

5. The method of claim 4, wherein the α- or β-chain is fused with a peptide sequence composed of 2 to 10 arginine residues and the β- or α-chain is fused with a peptide sequence composed of 2 to 10 histidine residues.

6. The method of claim 1, wherein the DNA sequences coding for the α- and β-chain are linked to DNA sequences coding for peptide sequences that are capable of reversible binding and are expressed on one expression plasmid cloned into one cell.

7. The method of claim 1, wherein the α- and β-chain are fused with the same peptide sequences, and said peptide sequences are capable of reversible binding.

8. The method of claim 7, wherein the α- and β-chain are each fused with a peptide sequence composed of 2 to 10 histidine residues.

9. The method of claim 1, wherein the expression occurs at a growth temperature of 10°C to 25°C and at a reduced inducer concentration.

10. The method of claim 1, wherein the expression is increased by co-expression of helper genes.

11. The method of claim 10, wherein the *trpT* gene which codes for the tryptophan tRNA is used as the helper gene.

12. The method of claim 10, wherein the expression is increased by co-expression of chaperone genes.

13. The method of claim 10, wherein the genes for GroEL and GroES, Dnak and DnaJ, GrpE and/or ClpB are co-expressed.

14. The method of claim 12, wherein the genes for GroEL and GroES are cloned onto the expression plasmid which also carries the genes for the α- and the β-chain and the genes for Dnak, DnaJ, GrpE and ClpB are cloned onto a helper plasmid.

15. The method of claim 1, wherein suitable affinity chromatography materials are used to isolate or purify the recombinant heterodimeric AMV-RT.

16. The method of claim 15, wherein the affinity chromatography materials used for the purification reversibly bind the different peptide sequences bound to the α- and/or β-chain.

17. The method of claim 15, wherein the affinity chromatography materials used for the purification are metal ion chelating materials or cation exchangers.

18. The method of claim 1, wherein the DNA sequence SEQ ID NO:5 or DNA sequences SEQ ID NO:4 and SEQ ID NO:5 are expressed in a prokaryotic host cell.

19. The method of claim 1, wherein *E. coli* is used as the host cell.

20. The method of claim 1, wherein the active heterodimeric AMV-RT is composed of the subunits SEQ ID NO:6 and SEQ ID NO:7.

21. A method of amplifying RNA sequences comprising using an AMV-RT obtainable by a method as claimed in claims 1 to 20.